FOREST PRODUCTS
Project Fact Sheet

LOW ODOR, HIGH YIELD KRAFT PULPING

BENEFITS

- An increase in the pulp yield of several percent
- Low capital costs
- Elimination of virtually all sulfur emissions from the fiber line, providing effective odor control
- Development of chemical reaction models and mill simulations useful for predicting mill impacts and costs and for helping to design and plan future trials and demonstrations

APPLICATIONS

The models and simulations developed during this effort will be useful for designing, planning, and controlling future commercial installations.

Oxygen Injection into Kraft Pulp Line Expected To Decrease Sulfur Odors and Increase Pulp Yields

During kraft pulping operations, sulfur-bearing odors are emitted into the atmosphere from multiple sites along the fiber line. These odors are a negative environmental aspect of pulp mills that need to be better controlled. While collection and combustion systems can be added to the pulp line at sites of major emissions, there are too many sources of low concentrations of odors to control in this manner.

It is possible, however, to eliminate the emissions before they reach the fiber line by isolating the digester, which contains all the odorous sulfur compounds before blowing. Earlier studies showed that if oxygen is injected into the circulation, extraction, or blow lines for black liquor at a temperature above 130o C, the kraft-derived sulfur pollutants are eliminated. Moreover, the yield of kraft pulp increases by 1 to 3 percent if oxygen is applied during the impregnation, heating, and early cooking stages.

In carrying out this project, researchers expect to determine the optimum conditions for conducting kraft processing in order to decrease odorous compounds and improve yields.

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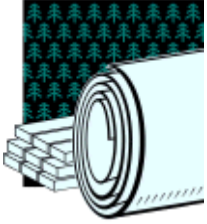
PROJECT DESCRIPTION

Goal: To demonstrate the potential for using kraft digester oxidation systems (IDO) to control sulfur odors and improve yields in pulp mills.

Demonstration of odor elimination will be sought through use of irreversible oxidation of all odorous kraft sulfur compounds to non-odorous species, by optimized oxygen injection in batch digesters. The investigation will focus on optimizing pulp yield while retaining or improving the properties and bleachability of the pulp. Experiments will also be conducted to find an explanation for the yield increases.

PROGRESS & MILESTONES

- Determine the optimal temperature and time parameters for injecting oxygen.
- Assay the inorganic reactants and reaction products of oxidation.
- Compare the characteristics of kraft and IDO pulps.
- Develop models to scale-up the reaction in mills and to project costs.
- Identify methods to carry out IDO in both continuous and various batch digesters.



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